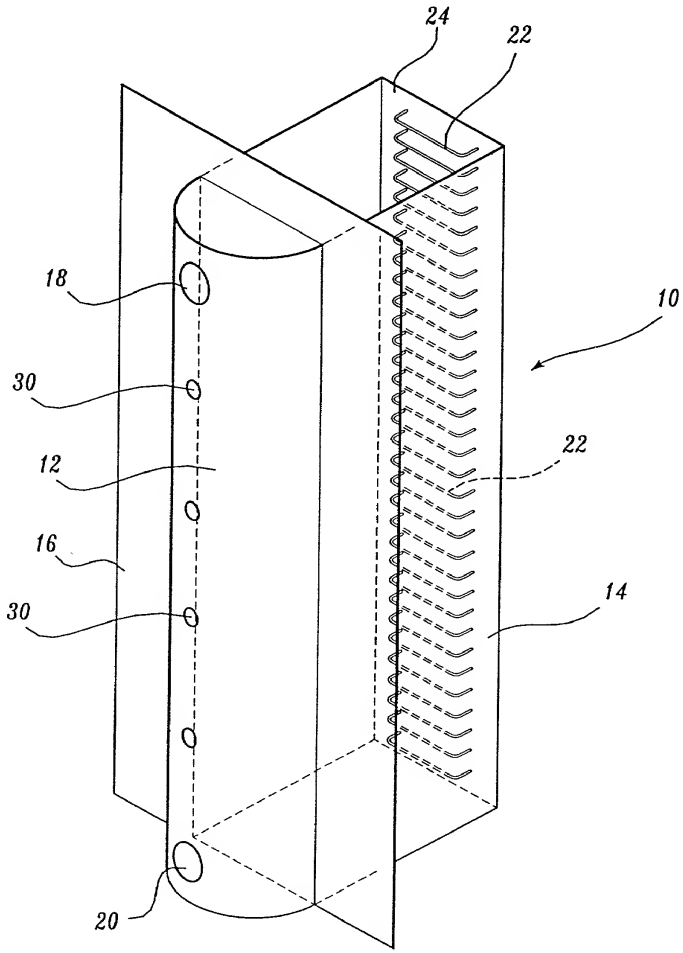


Fig. 1.

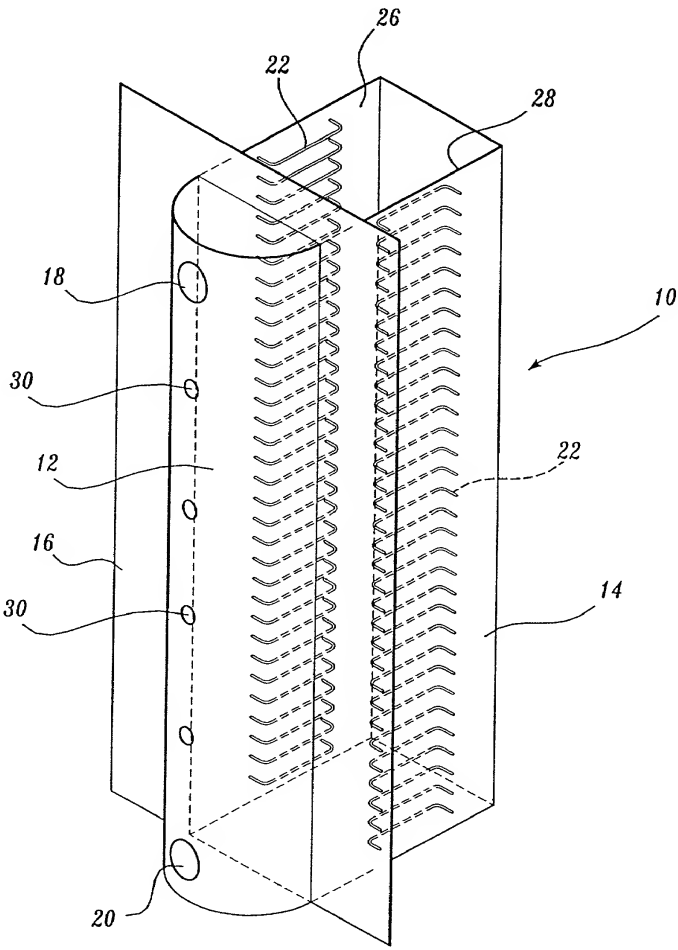
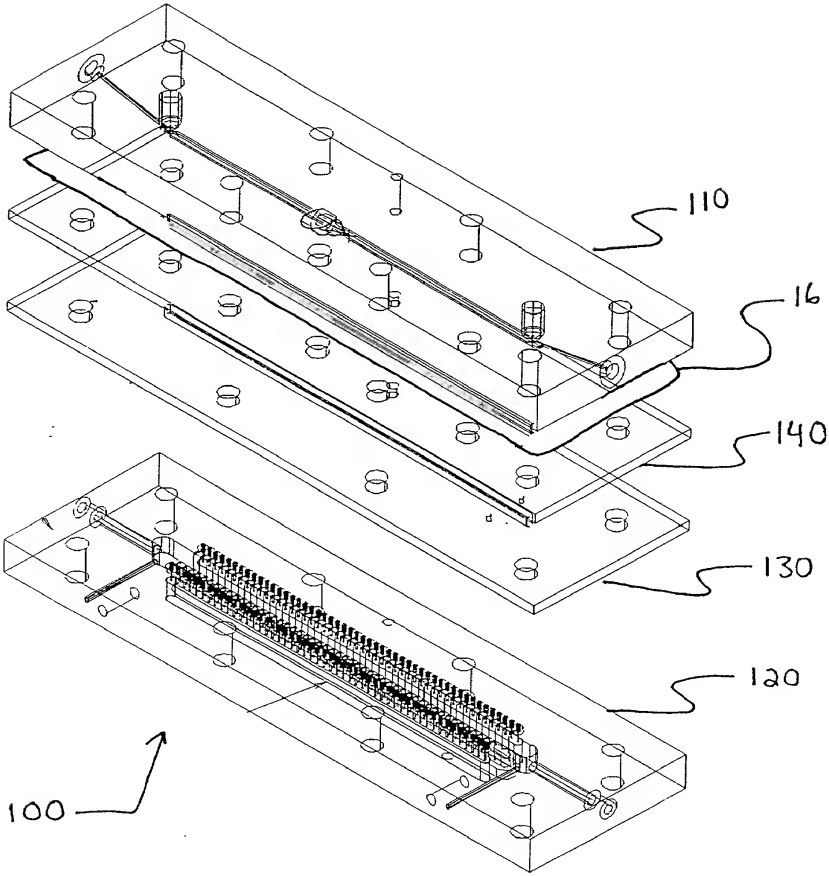
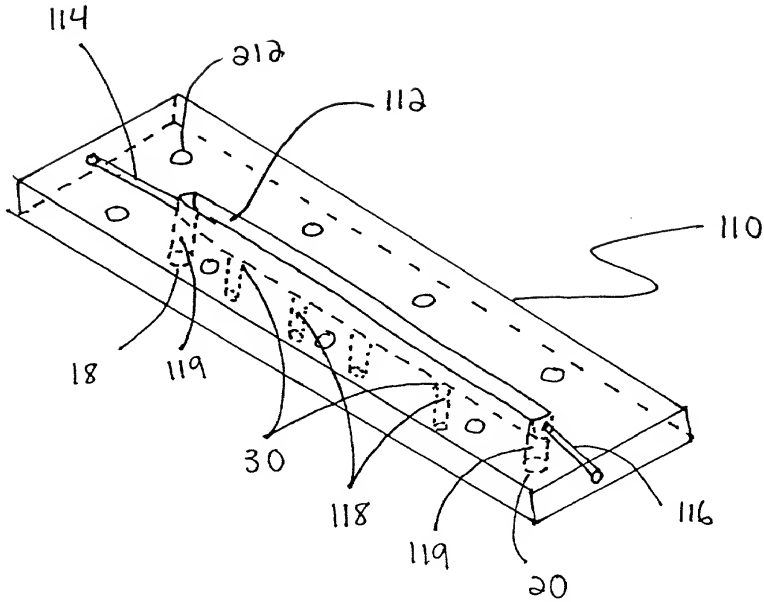


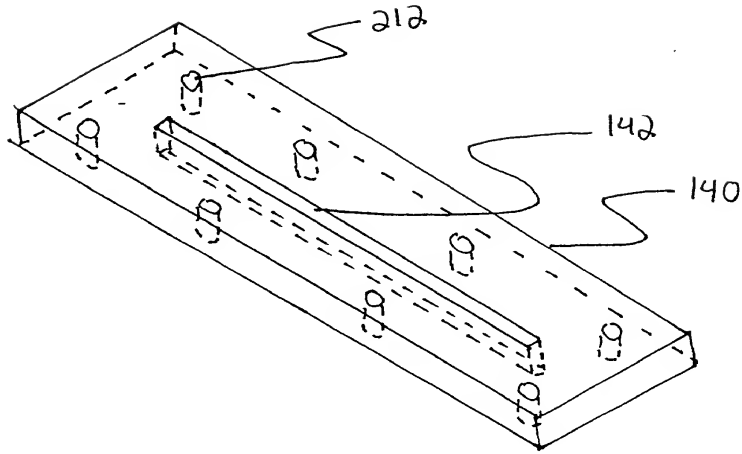
Fig. 2.



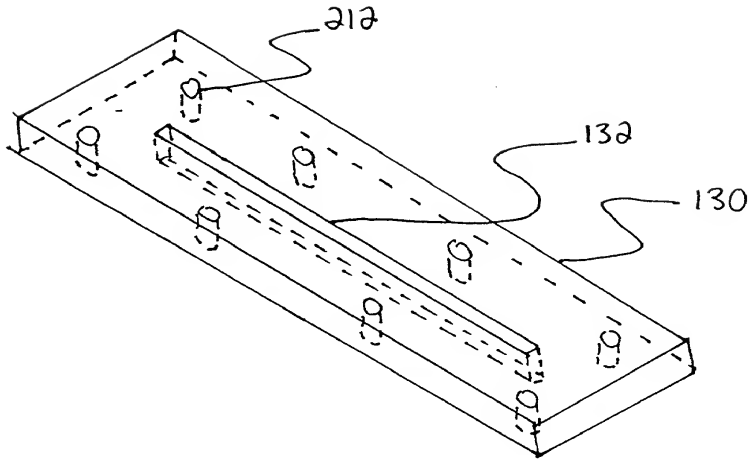
3A



3B



3C

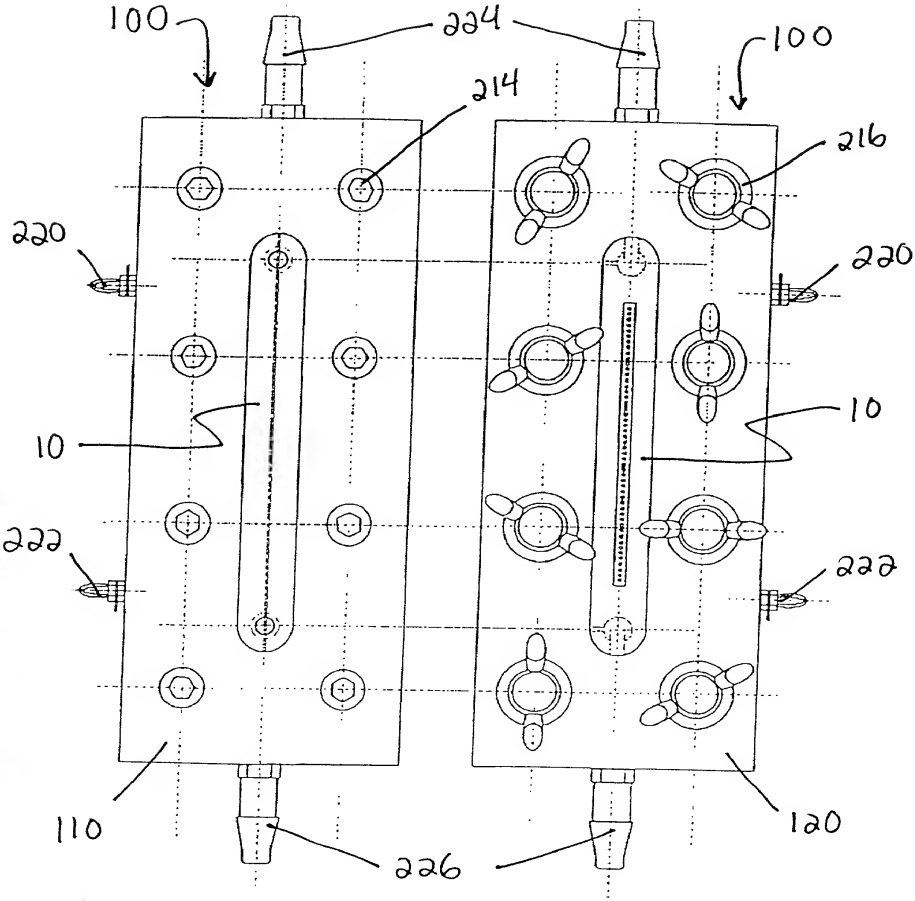


3D

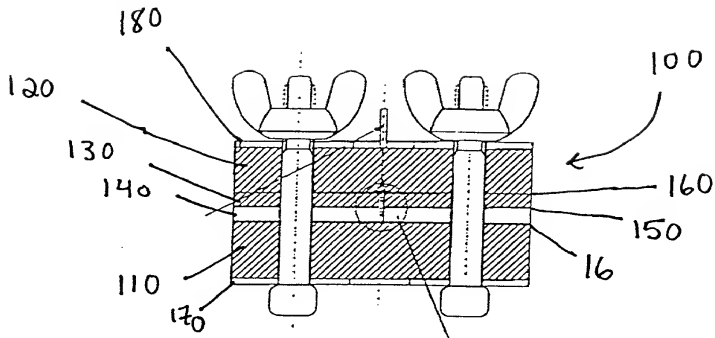
3E

FIG. 4

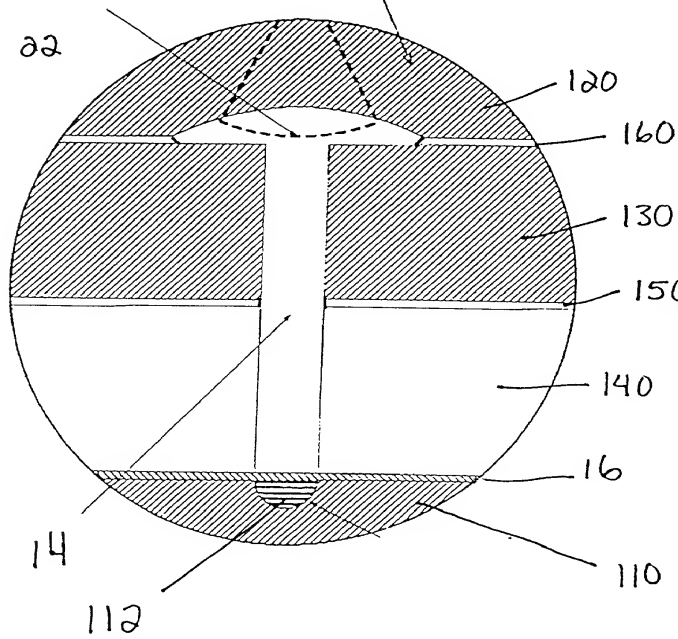
09654535 - 051501



5A 5B

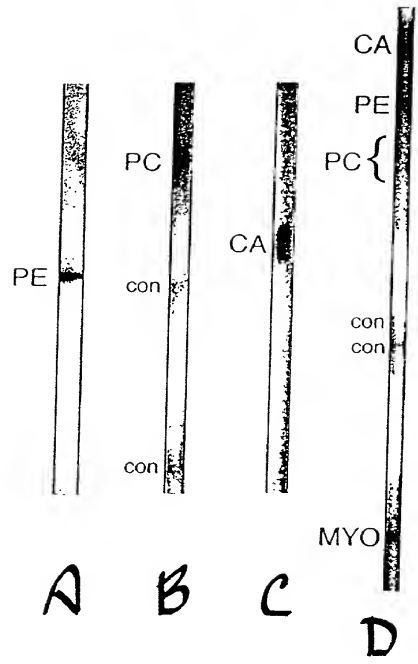

180
120
130
140
110
170
100
160
150
16

6A


22
120
160
130
150
140
16
14
112
110

6B

0960545 - 081004

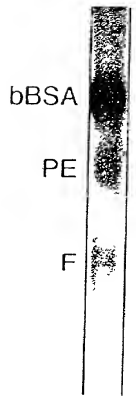


7

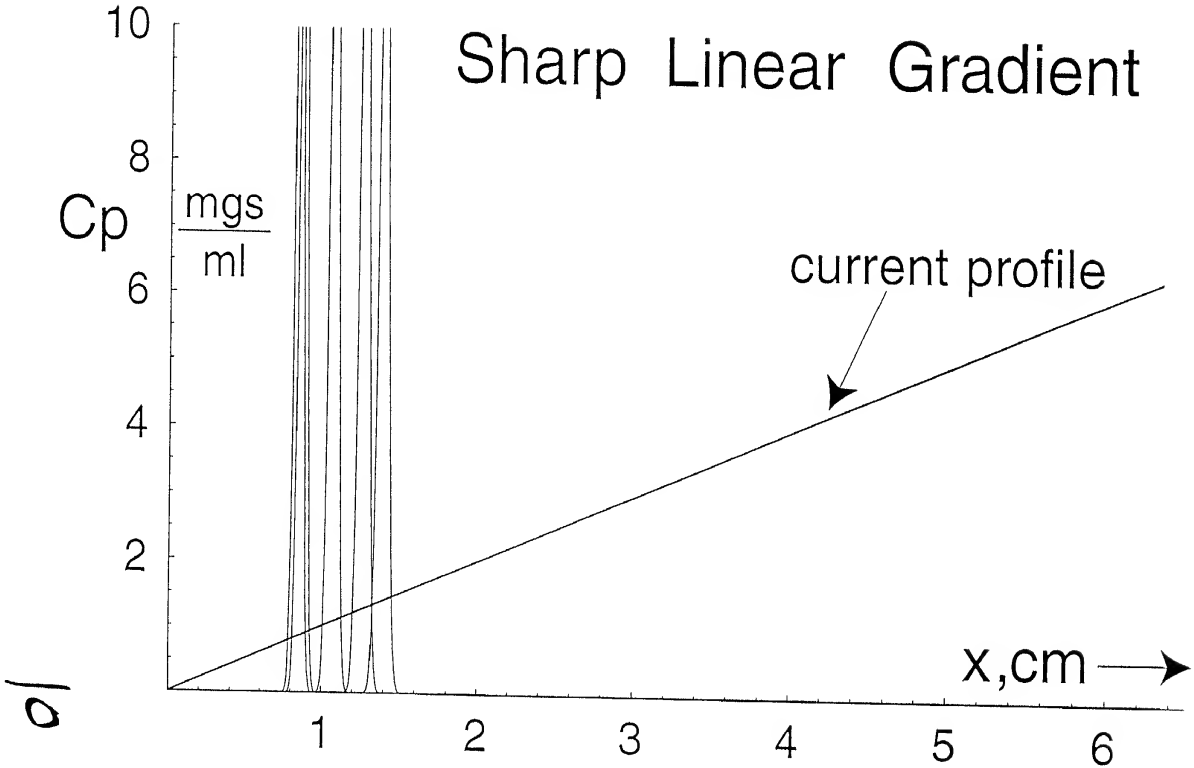
0985545-060494

8

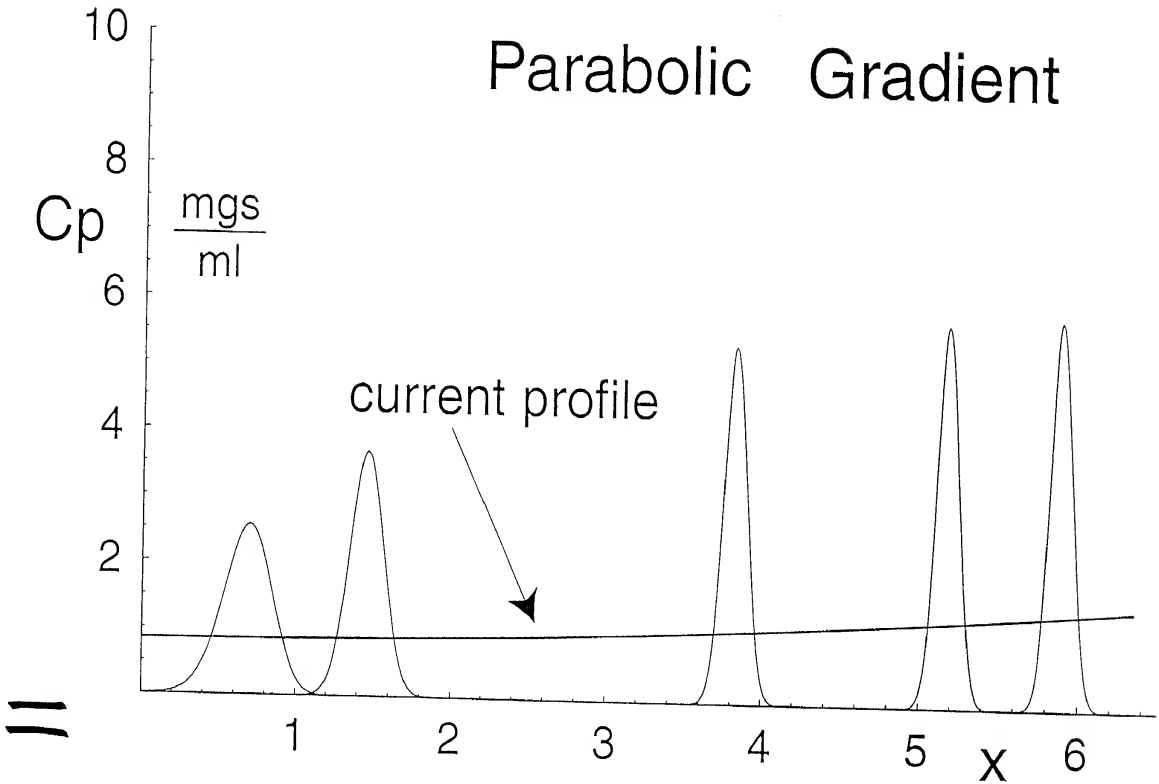
D9854.05.4004



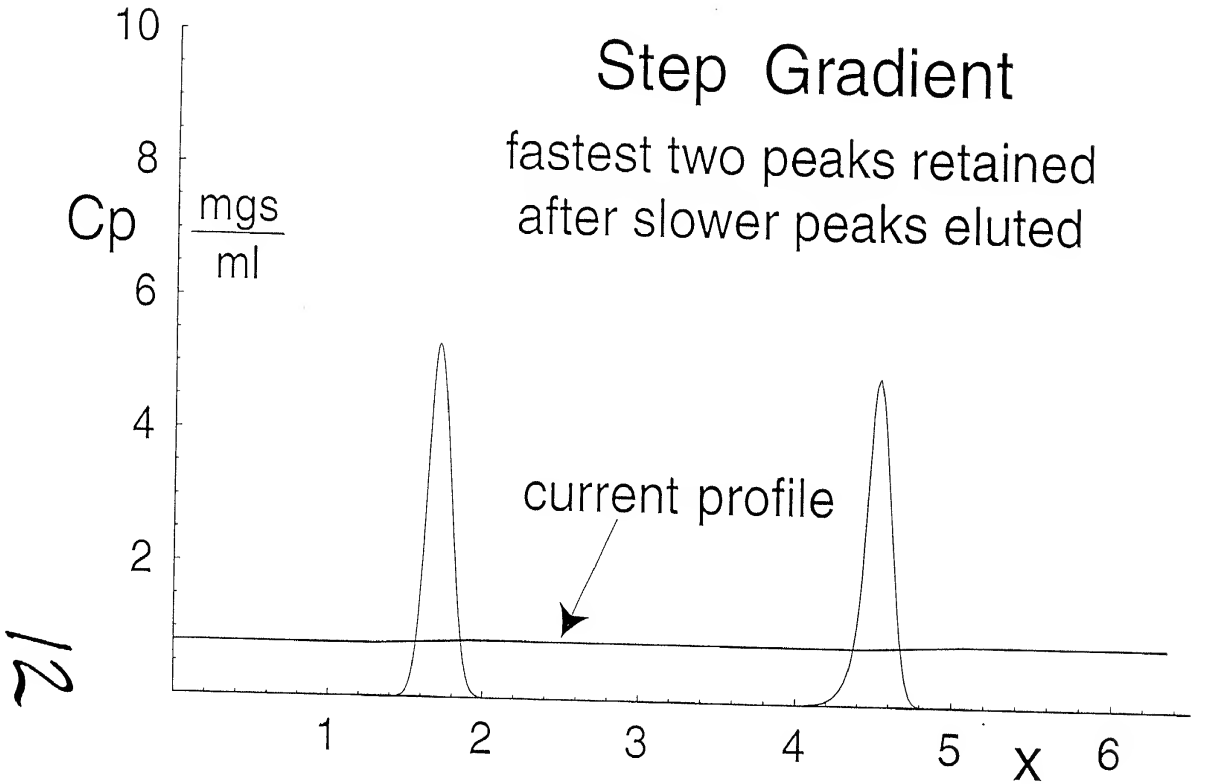
T06T90"6E4S9896O

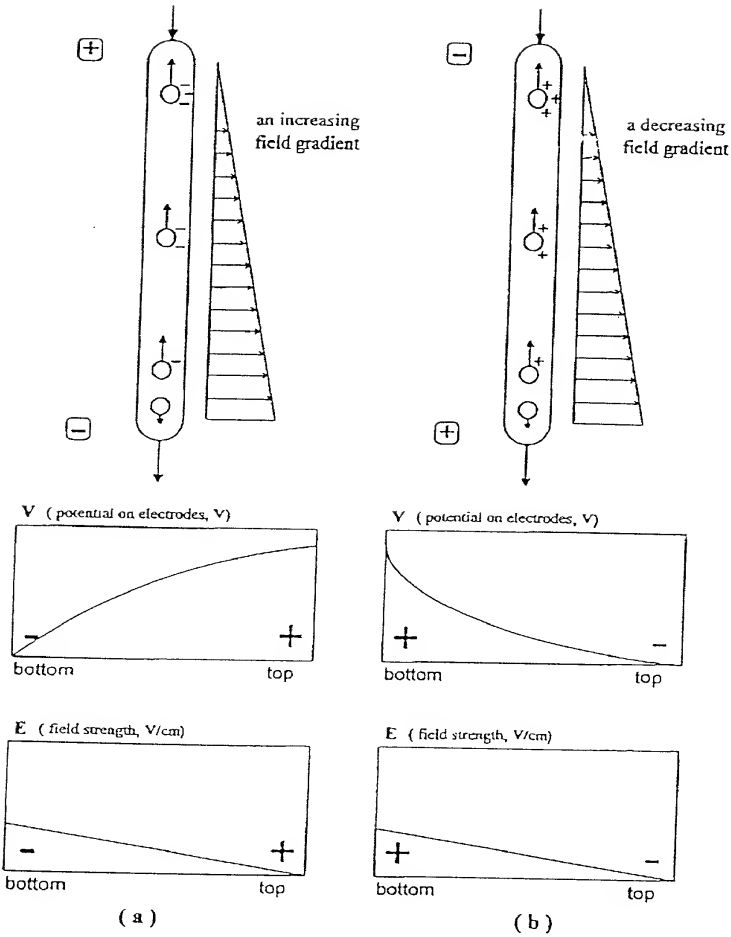


IDSTPO"6E4S8860



T06190 "6EK58960

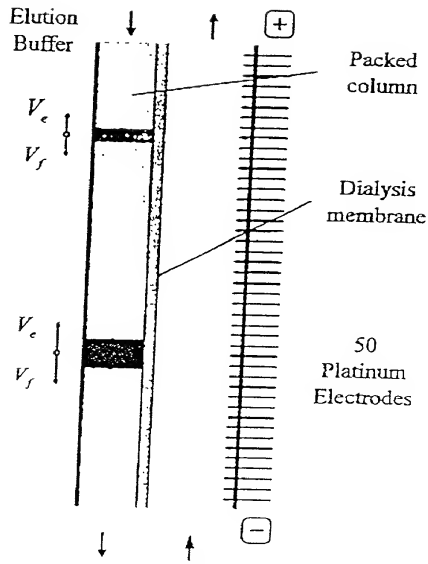



an increasing
field gradient
a decreasing
field gradient
V (potential on electrodes, V)
bottom
top
V (potential on electrodes, V)
bottom
top
E (field strength, V/cm)
bottom
top
E (field strength, V/cm)
bottom
top

(a)

(b)

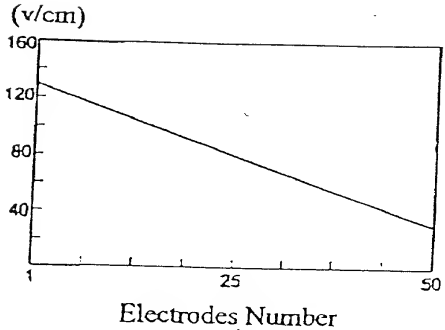
13



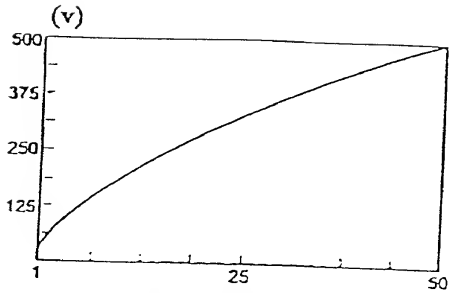
V_f Migration rate with elution buffer

V_e Migration rate of electrophoresis

$V_f = V_f$ At equilibrium zone

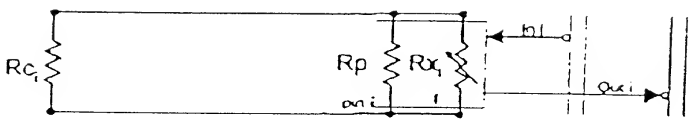

(v/cm)
160
120
80
40
1
25
50
Electrodes Number

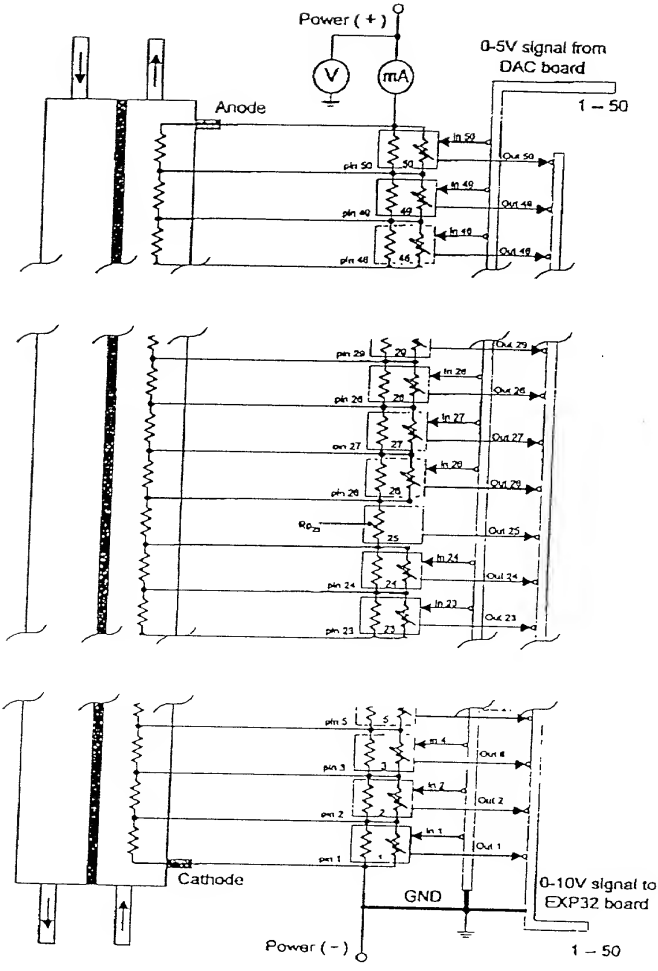
A


(v)
500
375
250
125
1
25
50
Electrodes Number

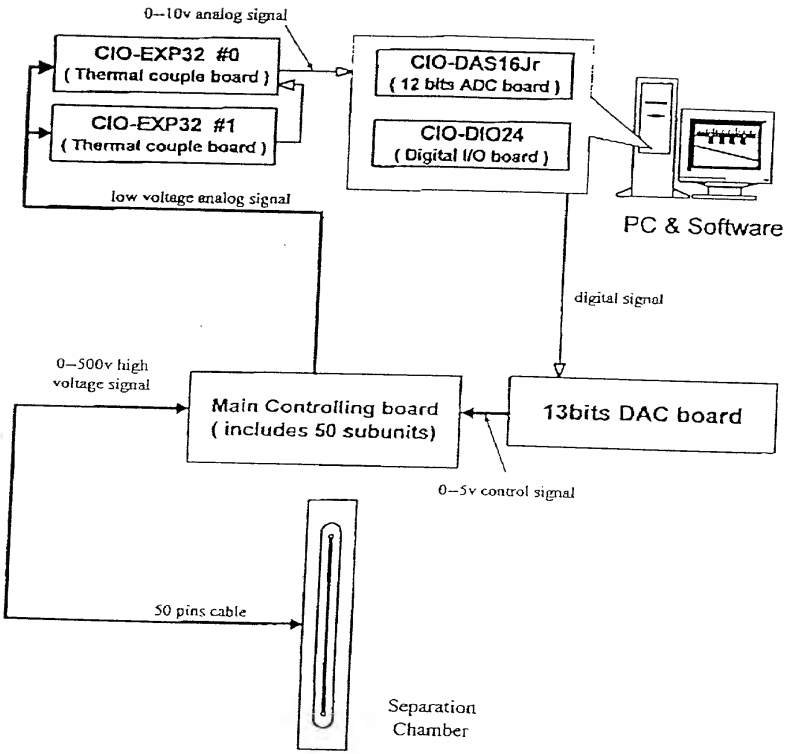
B

TOSHIBA-SEMICONDUCTOR

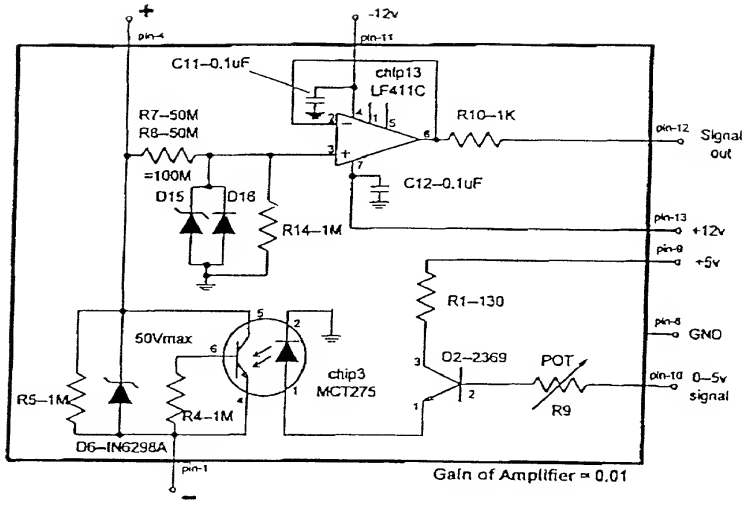



Power (+)
V
mA
0-5V signal from
DAC board
1 – 50
Anode
pin 50
50
In 50
Out 50
pin 49
49
In 49
Out 49
pin 48
48
In 48
Out 48
pin 29
29
Out 29
In 28
pin 28
28
Out 28
In 27
pin 27
27
Out 27
In 26
pin 26
26
Out 26
Rp
25
Out 25
In 24
pin 24
24
Out 24
In 22
pin 23
23
Out 23
pin 5
5
In 4
Out 4
pin 3
3
In 2
Out 2
pin 2
2
In 1
Out 1
pin 1
1
Cathode
GND
0-10V signal to
EXP32 board
Power (-)
1 – 50

17


0--10v analog signal
CIO-EXP32 #0
(Thermal couple board)
CIO-EXP32 #1
(Thermal couple board)
CIO-DAS16Jr
(12 bits ADC board)
CIO-DIO24
(Digital I/O board)
PC & Software
low voltage analog signal
digital signal
0--500v high
voltage signal
Main Controlling board
(includes 50 subunits)
13bits DAC board
0--5v control signal
50 pins cable
Separation
Chamber

18



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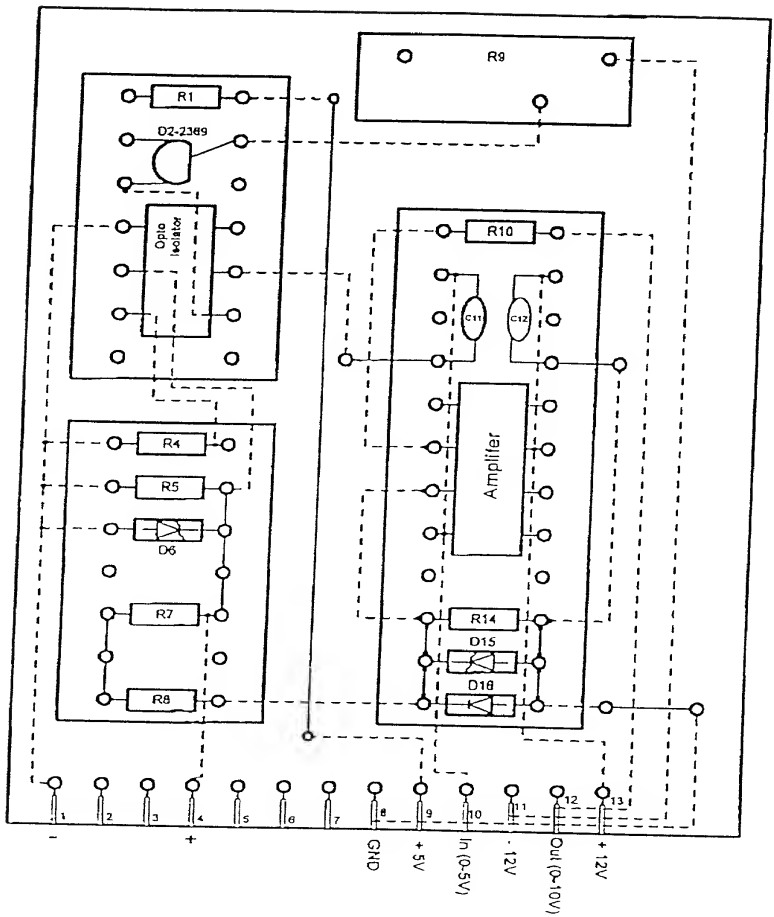
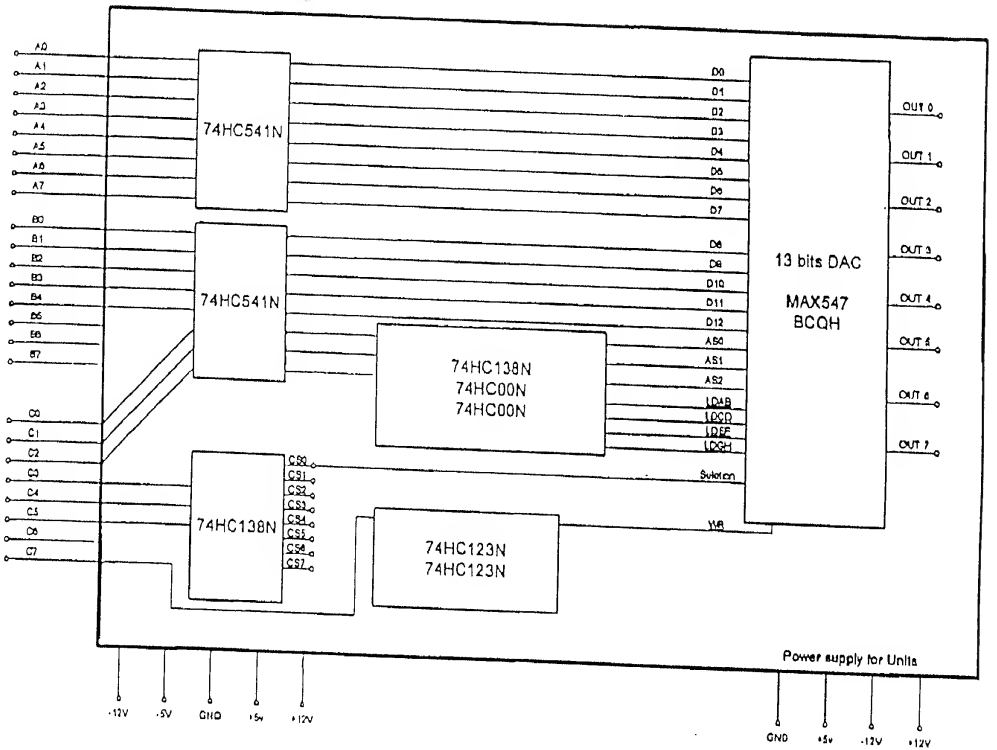

R9
R1
D2-2369
Opto Isolator
R10
C11
C12
Amplifier
R4
R5
D6
R7
R8
R14
D15
D16
1
2
3
4
5
6
7
8
9
10
11
12
13
-
+
GND
+5V
In (0-5V)
-12V
Out (0~10V)
+12V

20

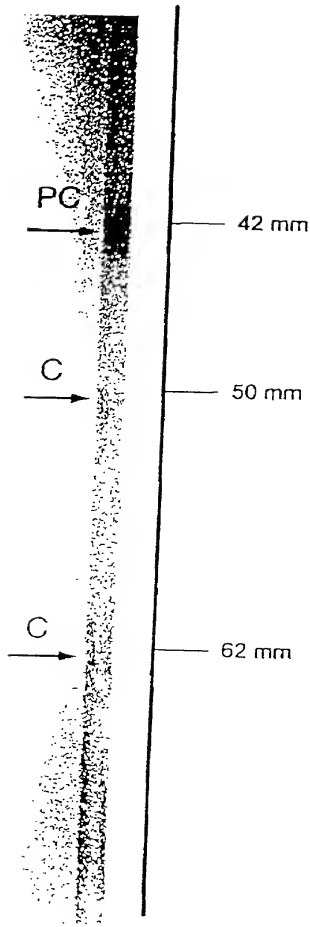
T06T90*6EN50860

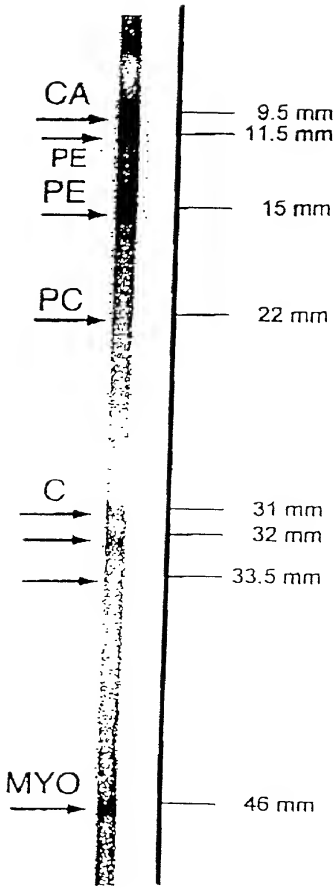


12

DAC
13 BIT
MAX
547
BCQH
OUT1
OUT2
OUT3
OUT4
OUT5
OUT6
OUT7
OUT8
OUT9-OUT11
OUT11-OUT14
Same as above
Same as above
LDAB
LDCD
LDEF
LDGH
74HC00
74HC04
74HC154
74HC
541
74HC
138
74HC123
REXTCEXT
CEXT
CLR
LOAD

22


PC
42 mm
C
50 mm
C
62 mm



24

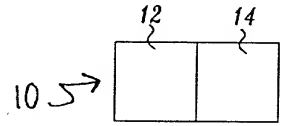


Fig. 25A.

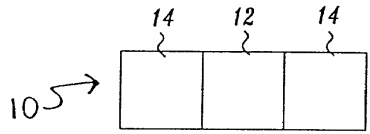


Fig. 25B.

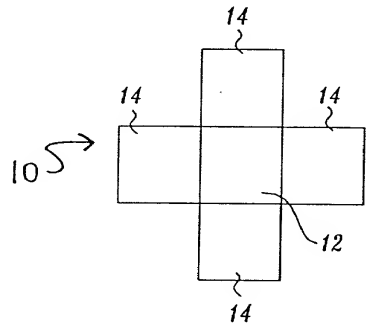


Fig. 25C.